

REMARKS

This amendment is responsive to the Office Action of July 17, 2008. Reconsideration and allowance of claims 1-3, 4-9, 11, 17-20, and 22-28 are requested.

The Office Action

The specification stand objected to as failing to provide proper antecedent basis for the claimed subject matter of Claim 27.

Claim 27 stands objected to because of minor informalities.

Claims 1, 22, 27, and 28 stand rejected under 35 U.S.C. § 112.

Claims 22 and 27 stand rejected under 35 U.S.C. § 101.

Claims 1, 11, 22, 23, 27, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Davis (US 5,907,619) in view of Genaro et al. (US 6,009,176).

Claims 2, 4, 5, 17-21, and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Davis (US 5,907,619) in view of Genaro et al. (US 6,009,176) and in further view of Baker et al. (US 5,790,110).

Claims 6, 25, and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Davis (US 5,907,619) in view of Genaro et al. (US 6,009,176) and in further view of Kwon (US 5,373,323).

Claims 3 and 7-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Davis (US 5,907,619) in view of Genaro et al. (US 6,009,176) and in further view of Isnardi et al. (US 6,037,984).

The Present Amendments

The present amendment raises no issues that would require further search or consideration.

Claim 27 has been amended to overcome the objection pertaining informalities.

Claims 1, 22, 27, and 28 have been amended to overcome the rejection under 35 U.S.C. § 112 as being indefinite.

Claims 22 and 27 have been amended to overcome the rejection under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Claims 4 and 21 have been cancelled.

Claims 1, 3, 5-6, 18-19, 22-25, and 27-28 have been amended.

Claims 29 and newly presented, fully supported claim.

The Present Application

The present application is directed to a method of embedding an authentication signature in an interlaced or non-interlaced video in real time. The signature is embedded in such a way that only part of an entire frame of an audio-video sequence is stored in memory while the signature is calculated and the watermark is embedded, this obviates the need to buffer an entire frame of the audio-video signal thus reducing the cost of memory needed.

A feature that distinguishes the present application over the references of record is that the portion of the frame is directly watermarked. The present application does not require the video signal to pass through a compression algorithm such as discrete cosine transformation (DCT) or pass through a hash function to then have the checksum watermarked.

The References of Record

Davis teaches of a method for compressing and digitally signing the compressed video data. The frame is compressed and passes through a hashing function. The hash digest is then digitally signed.

Gennaro et al. teaches of signing digital streams for authentication. The computation and verification of the digital signature is performed on a portion of the digital stream, more specifically a sequence of frames. In addition, Gennaro et al. teaches of digitally signing the hash of a frame.

Baker et al. teaches of outputting composite video signal from a digital source and inserting video control information such as blanking, color bursts, synchronization, and other information.

Kwon teaches of converter circuit that converts interlaced signals into non-interlaced signals.

Isnardi et al. teaches that an image or series of images are passed through a DCT unit and the outputted array of quantized DCT coefficients are watermarked.

**The Claims Distinguish Patentably
Over the References of Record**

The Claims are Not Obvious Over Davis in view of Gennaro et al.

Claim 1 calls for each frame of an audio-video signal to have two portions. The first frame portion is loaded into a buffer memory and then a signature is calculated based on the first frame portion stored in the buffer memory. The first frame portion is then replaced in the buffer memory with the second frame portion. The second frame portion is then embedded with the signature calculated based on the first frame portion. By contrast, Davis discloses a method and apparatus for signing compressed video data. The Davis method requires the extra step of compressing the frame using DCT and partitioning into sections comprised of the DCT coefficients (column 5, lines 10-23). The applicant would like to point out that the sections or coefficient matrices do not comprise portions of the original image frame, but rather contain the high frequency and low frequency image data of the frame. The DCT coefficients are then passed through a hash function where the outputted hash digest is then digitally signed (column 6, lines 35-36). The present application differs because the second frame portion is signed directly without requiring compression techniques or a hash function thus resulting in real-time signature embedding. The Examiner relies upon Gennaro et al. in combination with Davis . But in contrast with the present application and the Davis teaching, Gennaro et al. teaches digitally signing the hash of a combined block (column 5, lines 23-26) in which a combined block is composed of a video frame (column 4, lines 15-16) and ancillary information (column 3, lines 51-53 & Figure 1). Unlike Davis, Gennaro et al. does not teach of using any form of compression to separate the frame into frequency components.

Moreover Gennaro et al. does not separate the frame first and second portions, as set forth in claim 1. Thus, neither Davis, nor Gennaro et al., nor the combination thereof disclose splitting each frame into at least two portions. The Examiner asserts that Gennaro et al. addresses storing a first frame portion by pointing to the portion of Gennaro et al. that indicates he intends to reduce the computation time. This is contrary to claim 1 which addresses the memory requirements rather than computation time.

For the reasons set forth above, it is submitted that claims 1 and claims 2-3, 4-9, 11, and 17-20 dependent therefrom distinguish patentably over the references of record.

Dependent claims 18 and 20 emphasize this distinction. **Claim 18** calls for the first and second portions to be the even and odd lines of an interlaced frame. **Claim 20** calls for the first and second portions to be the upper and lower halves of a non-interlaced frame.

Claim 22 calls for embedding the signature in a different portion of the frame than the portion from which it was calculated. In contrast, in Davis and Gennaro et al. the signature is calculated based on the frame that it is embedded in.

Claim 23 calls for a processor to calculate the signature of the second frame portion wherein that signature is to be embedded in a portion of a subsequent frame. Since claim 22 is not obvious over Davis in view of Gennaro et al., therefore Claim 23 remains in good standing based on the argument above. Nonetheless, the Examiner relied upon Gennaro et al. to teach a small buffer for the receiver to authenticate a digital stream which has already been signed; whereas, Claim 23 calls for the calculation of a signature based on the second frame portion for embedding in a subsequent frame portion. For the reasons set forth above, it is submitted that Davis taken with Gennaro et al. does not render claim 23 obvious or any claim dependent there from.

Claim 27 calls for the frame portions to be matched in size.

Claim 28 calls for slices to be substantially equal in size. For example, the slices maybe substantially equal in size in the event a frame has an odd number of horizontal lines. Claim 28 also calls for the calculation of the signature based on one slice and embedding it in another. As mentioned above, both Davis and Gennaro et al. alone or in combination teach away from the present application. For the reasons set forth above, it is submitted that Davis taken with Gennaro et al. does not render claim 28 obvious.

Claims 2, 4, 5, 17-21, and 24 are Not Obvious Over Davis in view of Gennaro et al. and in further view of Baker et al.

Baker et al. discloses of outputting composite video signal from a digital source and inserting video control information such as blanking, color bursts, synchronization, and other information. Column 18 lines 59-60 and column 19 line 10 merely describes checking whether “sixteen pixels generated from the same luminance and chrominance components have been placed on four adjacent lines” (column 18, lines 36-39) and that this check is performed on the entire screen include interlaced video. (column 19, lines 1-10). The Baker et al. reference is completely silent regarding embedding a signature in an audio-video signal. Regarding Davis and Gennaro et al., Baker does not disclose a hash function or digitally signing a hash digest. Baker only discloses of interlaced video, but makes no suggestion of embedding a signature calculated based on odd lines in the even lines or vice versa. The examiner believes that the mention of interlaced video in the Baker reference is sufficient reason to combine the references. The applicant respectfully disagrees,

“Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” (*In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006)).

For the reasons set forth above, it is submitted that Davis taken with Gennaro et al. and in further view of Baker et al. does not render claims 2, 4, 5, 17-21, and 24 obvious or any claim dependent there from.

Claims 6, 25, and 26 are Not Obvious Over Davis in view of Gennaro et al. and in further view of Kwon

Kwon merely discloses a converter circuit that converts interlaced video signals into non-interlaced video signals. The Examiner cites the portion of the Kwon reference that describes the prior art in the field of interlace to non-interlace scan converters. It is the applicants understanding that the Examiner cited the Kwon references because it mentions the words interlaced, non-interlaced, and camera. Neither Kwon, Davis, Gennaro, or the Examiner cite a sufficient reasoning to combine the references.

"Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (*In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006)).

For the reasons set forth above, it is submitted that Davis taken with Gennaro et al. and in further view of Kwon does not render claims 6, 25 and 26 obvious or any claim dependent there from.

Claims 3 and 7-9 are Not Obvious Over Davis in view of Gennaro et al. and in further view of Isnardi et al.

Isnardi et al. discloses that an image or series of images are passed through a DCT unit and the outputted array of quantized DCT coefficients are watermarked (column 2, lines 19-23) similar to the Davis reference. Isnardi et al. actually teaches away from the present application because the present application discloses applying a digital signature directly to the portions of the frame without resorting to compression techniques such as DCT to separate the image into frequency components. In addition, the Examiner has not provided sufficient reason to combine the prior art references.

"Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (*In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006)).

For the reasons set forth above, it is submitted that Davis taken with Gennaro et al. and in further view of Isnardi et al. does not render claims 3 and 7-9 obvious or any claim dependent there from.

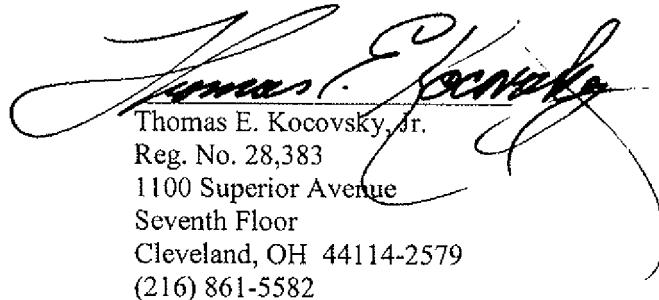
CONCLUSION

For the reasons set forth above, it is submitted that claims 1-3, 5-9, 11, and 17-20, and 22-28 (all claims) distinguish patentably over the references of record and meet all statutory requirements. An early allowance of all claims is requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case(s), the Examiner is requested to telephone Thomas Kocovsky at (216) 861-5582.

Respectfully submitted,

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